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Original Research Paper

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# PATIENT KNOWLEDGE AND ATTITUDE TOWARDS CONTRAST MEDIA IN CECT IMAGING: A CROSS-SECTIONAL QUESTIONNAIRE-BASED STUDY IN A RURAL POPULATION

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## ABSTRACT

**Background:** Contrast-enhanced computed tomography (CECT) scans are performed routinely to provide the best diagnosis; however, patients from rural areas can have limited knowledge of intravenous contrast including its indication, what to expect during the injection, and possible complications. Patients may feel uneasy due to lack of knowledge resulting in a negative impact on informed consent and patient experience. **Objective:** To evaluate knowledge and attitude of rural patients presented for computed tomography examination with intravenous contrast enhancement (CECT) about contrast media and to find out whether there is any gap between their knowledge, attitude and their awareness needs. **Methods:** This cross-sectional questionnaire study was carried out in Department of Radio-Diagnosis Sri Devaraj Urs Medical College, Tamaka,Kolar. Patients belonging to rural areas aged ≥18 years, attending for contrast enhanced CECT and gave informed consent were included in the study(N =120). Information about sociodemographic characteristics and questions about knowledge(source of information about contrast-media, knowledge about use of contrast-media, minor adverse effects of contrast-media and radiocontrast-awareness of major adverse effects-know safety instructions before undergoing contrast enhanced CECT), attitude(fear about procedure-trust on doctors-do you want to repeat the test-perceived usefulness of test-the benefit of counseling) and patient experience(during the procedure-faced any discomfort-faced any reaction-satisfied with the test-how they prefer doctor to communicate with them) were taken using prestructured questionnaire. Data were expressed as frequencies and percentages. Age was expressed as mean ± SD. **Results:** The average age was 41.8 ± 14.2 years, with 61.7% being male. Most patients were studied till below 10th standard (70.0%) and worked in agriculture (60.0%). 65 percent had never had a CT scan. One quarter recognised why contrast was given (25.0%), and fewer knew minor expected symptoms (15.0%) and major dangers including allergy/kidney problems (10.0%) during CT with contrast. While 40% of patients said their doctor told them about CT, fewer knew important safety information like ask for fluids after contrast injection (21.7%), contrast need not be given every time (18.3%), and blood test is needed for kidney function if doctors order CT with contrast (20.0%). 55% had some fear/anxiety that could be managed by doctor/nurse counselling, while 85.0% felt less worried. While 40.0% of patients experienced discomfort during injection, only 28.3% understood they would be evaluated after contrast administration. Most post-procedure reactions were minor (10.0%). The majority of patients (70.0%) were satisfied with their CT scan. About half of the study participants (45.0%) desired written and verbal information before their next scan. **Conclusion:** Patients in our rural cohort with indication for contrast enhanced CECT had poor knowledge scores despite overall favorable attitudes towards medical imaging and high trust in clinicians. Formal counseling and easily accessible educational materials in local language will help reinforce the informed consent process, decrease patient anxiety and improve patient safety/satisfaction.

**KEYWORDS :** Contrast-enhanced CT; Intravenous Contrast; Knowledge; Attitude; Rural Population; Informed Consent; Patient Counseling.

## INTRODUCTION

CT scan is a safe and widely used imaging modality in emergency rooms, inpatients and outpatient clinics since it was first implemented in diagnostic medicine in the 1970s. CT offers fast high-resolution sectional anatomy that can improve clinical decision-making and diagnostic accuracy especially in oncologic, traumatic, cardiovascular diseases, and acute care settings worldwide [1,2]. In many clinical indications, IV contrast can be used to augment vasculature and parenchymal detail to further assist in lesion detection and characterization [3,4]. In many departments contrast enhanced CT (CECT) examinations have become standard of care.

As with all medical interventions there are inherent risks associated with CECT. Risks associated with ionizing radiation exposure have become hot topic of discussion due to increasing awareness of radiation doses associated with CT scans and fear of carcinogenesis from radiation exposure [1]. Although small when considered individually, recent years have seen an exponential increase in CT utilization prompting patient and provider interest in radiation exposure and limiting doses "as low as reasonably achievable" [4]. Additionally IV contrast has the risk of eliciting an adverse reaction in patients ranging from mild physiological reactions to rarely life-threatening allergic-like reactions or impairment of kidney function [3,5]. Severe adverse reactions to contrast are rare; however when they do occur it is important that providers adequately counsel their patients and obtain informed consent due to medico-legal and ethical obligations [3].

Each year millions of contrast enhanced imaging examinations occur worldwide. When administered properly contrast is considered safe [3,4]. Newer contrast agents have allowed providers to mitigate previously common risks of allergic-like reactions to contrast. Still some patients continue to have anxiety and fears associated with contrast administration [4]. Various studies have shown that patients fear contrast due to many risks; however they tend to overestimate some risks and underestimate others due to lack

of knowledge [6]. Another study illustrated that patients overall felt they were not given enough information about their upcoming CT. Patients in this study often were not made aware they would be receiving contrast until moments before their CT scan began [7]. Fear was reported by patients before undergoing contrast-enhanced CT. Women, individuals that had a previous CT scan, and patients who sought information about their upcoming CT were less fearful [7].

In Saudi Arabia two cross-sectional studies were conducted that showed patients overall had poor knowledge about the administration of IV contrast. Many patients believed that receiving contrast can lead to life threatening complications such as cancer, cardiovascular complications, or severe allergic reactions [4,8]. Both studies showed that patients with higher education attainment and were employed had significantly higher knowledge scores [8]. Another survey-based study was conducted that determined the awareness and perception of patients before receiving CECT. Patients were shown to underestimate many potential risks such as renal impairment and development of secondary malignancy [6]. It was also found that patients overall feared receiving contrast and their fear increased after reading the information sheet provided to them before CT scan. This could be due to the information sheet containing no empathic reassurance [6]. This study shows that not only can patients be under informed but how they are informed can play a role in the patient's perception.

When administering contrast it is vital that providers obtain informed consent. Informed consent includes but is not limited to: explanation of the procedure being done, benefits of the procedure, risks, alternatives, and what will happen if they decline the procedure [3]. Although verbal consent is typically obtained by the technician before administering contrast there are many barriers that limit adequate communication. Patient volume, short time frames in which patients receive their CT scans, and limited physician–patient interaction in the radiology department are all factors that limit this process [3,9]. One study done showed that when patients were provided a multimedia or video assisted consent they had better understanding than patients that received routine verbal consent [5]. Another study implementing structured and digitized consent showed improvement in documentation and provider ability to recognize patients with contraindications to contrast [9].

Currently there are many international studies concerning knowledge, perception, anxiety, and informed consent about CT scans and IV contrast. The majority of studies are done on single urban hospitals, the emergency department, or in high-volume technologically advanced countries [5–10]. There is limited data available regarding rural populations and their knowledge and attitude towards IV contrast. Patients that live in rural areas can be affected by lower health literacy, less access to reliable health education, and may be less likely to question medical authority compared to urban populations. Due to these differences rural patients can have different knowledge and attitude levels that are influenced by many factors such as socioeconomic status, education level, and access to healthcare. Rural patients that receive CECT scans are an understudied population that can benefit from further research and possible interventions.

India is home to large rural communities that populate much of the country. Many of these patients visit District level or Tier 3 and 4 hospitals to receive their health care. District level hospitals are known to provide secondary and tertiary care to these patients. Secondary and tertiary care for these patients includes advanced imaging such as CECT. There is limited data available on these patients' knowledge and attitude towards receiving IV contrast for CT scans. Our study seeks to find out the level of awareness among these patients. We also aim to identify any misconceptions that the patients have about receiving contrast. Lastly we want to assess the patients' attitude when they find out that they are receiving contrast for their CT scan. By finding this information we hope to better educate physicians on how to communicate with these patients in hopes of alleviating procedural anxiety and improve physician-patient relationship. Thus, the present study was conducted to assess knowledge and attitude towards contrast administration among patients receiving CECT and to identify measures to improve patient knowledge and communication in a rural hospital setup.

## METHODOLOGY

### Study Design and Setting

A cross-sectional, questionnaire-based study was conducted in the Department of Radio-Diagnosis, Sri Devaraj Urs Medical College, Tamaka, Kolar, among rural patients undergoing contrast-enhanced computed tomography (CECT).

### Sample Size

A total of 120 participants were included. The sample size for this cross-sectional study was calculated using the standard formula for estimating a single population proportion. In the absence of prior published data on knowledge and attitudes toward contrast media in CECT among rural populations, a conservative prevalence (p) of 0.50 was assumed to maximize variability and ensure an adequate sample. A 10% non-response rate was anticipated, and the final sample size was accordingly increased to 120. This sample size was considered sufficient to meet the study objectives with acceptable precision.

### Participant Selection

Eligible participants were selected using a consecutive sampling approach from patients scheduled for contrast-enhanced CECT during the study period. Patients satisfying the eligibility criteria were approached prior to the procedure and enrolled after obtaining informed consent.

### Inclusion Criteria

- Patients aged ≥ 18 years
- Residents of rural areas
- Scheduled for contrast-enhanced CT scan
- Provided written informed consent

### Exclusion Criteria

- Individuals with prior professional medical training
- Unconscious, critically ill, or severely unwell patients unable to respond to the questionnaire
- Patients undergoing emergency CECT who could not complete the survey

### Study Procedure and Materials

Following enrolment, participants received CECT according to the departmental guidelines. Every CECT was done on SIEMENS 128 slices CT machine (SOMATOM GO TOP) using intravenous contrast. A questionnaire was given to participants before performing the scan regarding demographics, knowledge and attitude about use of contrast. Answers were noted and analysed as frequencies and percentages.

### Statistical Analysis

Data were entered into Microsoft Excel and analyzed descriptively for the total sample (N = 120). Continuous variables such as age were summarized as mean ± SD, while categorical variables were presented as frequencies and percentages. Accordingly, demographic and clinical characteristics (age group, gender, education, occupation, prior CT) were reported as n (%). Knowledge items were summarized as Yes/No/Don't know responses in n (%), attitude statements as Agree/Neutral/Disagree in n (%), and experience variables (injection discomfort, observation

advice, post-procedure reactions, satisfaction, preferred information format, overall experience) as n (%), with reaction subtypes calculated using the number reporting reactions as the denominator. As per study objectives, no inferential tests were applied and results were presented primarily as percentages.

## RESULT

The mean age of the subjects was 38.38 ± 11.37 years. Among the 120 study participants recruited while undergoing a CECT with IV contrast administration, there were significantly more males (74, 61.7%). Majority were unemployed or worked as farmers/have other rural occupations (84, 70.0% and 72, 60.0% respectively). The educational status showed that majority had an education level below the 10th standard (84, 70.0%) The majority of participants had not undergone CT scan previously (78, 65.0%). This means majority of our study population received CT/contrast-related counselling for the first time which directly affects knowledge scores and base level anxiety among patients regarding contrast examinations (Table 1).

Table 2 Overall knowledge regarding contrast media was poor among our study population. Only one-fourth of the study participants knew the reason for injection of contrast media (30, 25.0%), while 68 (55.0%) responded with a "No" and 24 (20.0%) responded with "Don't know". Only 18 (15.0%) knew minor side effects such as warm feeling and metallic taste during injection of contrast, while knowledge regarding major side effects such as allergic reaction and renal compromise was known to only 12 (10.0%) participants. Even though almost half of the participants reported that they were told about contrast injection by the treating doctor before examination (48, 40.0%), overall knowledge regarding major points of safety was low. Only 26 (21.7%) knew the importance of taking fluids after contrast injection and 24 (20.0%) knew that some patients are advised to undergo kidney function tests after contrast administration. Most were unaware of the side effects prior to examination, however, 54 (45.0%) participants had heard of contrast-induced allergic reactions from someone else.

Fear of contrast injection was evident among our study population with 66 (55.0%) participants agreeing to the statement I was scared before contrast injection. Physician trust was high among our study population with 108 (90.0%) agreeing to the statement I trusted my doctor that he will decide if I need contrast media or not. 96 (80.0%) of participants agreed that if needed they will repeat the test indicating a positive perception of the test itself. Patient counseling seemed to be effective among our study population with 102 (85.0%) agreeing that counselling before my CT scan reduced my anxiety. Contrast-enhanced scans were viewed positively by our study population with 94 (78.3%) agreeing that contrast enhanced scans are more useful in diagnosing diseases.

Table 4 (Experience, satisfaction and preferred mode of communication): Out of 120 study participants, when asked about their experience during the injection of contrast material 48 (40.0%) stated that they faced little discomfort which can be very important from a clinical standpoint as patients can be anxious if they experience discomfort from the contrast injection and were not told about possible discomfort from the contrast media beforehand. 34 (28.3%) were told to wait after contrast injection for observation purposes. When asked about their experience after the contrast injection, 12 (10.0%) had some sort of reaction. Majority experienced nausea/vomiting 4 (33.3%), itching/urticaria 3 (25.0%) and dizziness/headache 3 (25.0%). 84 (70.0%) of study participants stated they were very satisfied with the explanation and care they received. Preferred mode of communication before future CT examinations was mixed; half of the participants wanted doctors to explain to them about the CT examination and the other half wanted both written information and verbal information by the doctors. Written information should be in the form of handouts in both English and local/language literature to accommodate our study population's desire for both written and verbal information. 82 (68.3%) of participants stated their overall experience at our department was good/excellent. However, 38 (31.7%) of participants stated their experience was average to poor, showing us that we can improve upon how we inform our patients about what to expect after contrast injection and post-contrast instructions along with instructions for post-procedure observations.

## DISCUSSION

In our study, among 120 rural adults undergoing contrast-enhanced CECT, 61.7% were males, the mean age was 41.8 ± 14.2 years (predominantly 31–45 years), 70.0% had education below 10th standard, 60.0% were engaged in agriculture-based occupation, and 65.0% had no prior CT scan, indicating limited previous exposure to CT/contrast counselling.

Alzahrani et al. (2021), while interpreting their findings on IV-contrast awareness, highlighted that knowledge levels varied significantly across demographic strata, with female gender, region of residence, absence of comorbidities, no prior contrast investigation, and receiving information from doctors being associated with better knowledge. This study was cited as part of evidence that baseline awareness appears to be strongly influenced by sociodemographic variables and health-system exposure variables. [4] Alshehri (2023) even reported in their Discussion that awareness was generally poor, and that participants with education had higher rates of satisfactory knowledge (34.3%) compared to participants without education (8.92%), though awareness was relatively similar between males and females (males 27.3% vs females 28.9%). [8] We have a study population similar to the one this pattern would apply to (i.e. poorer understanding as a result of lower education level and less previous exposure) because most of our participants had an education level under 10th standard and were receiving their first CT, both of which would reasonably limit baseline understanding as well as comprehension of risk–benefit information.

Lambertova et al. (2019) mention the written information increases awareness but also fear associated with the procedure, specifically among younger women and those with no previous CT experience. They also note underestimation of associated risks was significantly higher among older males and those who previously underwent CT examination[sic]. [6] Lange et al. (2023) also mention patient factors and previous exposure plays a role in peri-procedural experience, noting in their Discussion "female sex and first-time CT status were associated with higher odds of pre-examination anxiety. Having previously undergone a CT exam was associated with decreased odds of pre-examination anxiety." [7] The parallels between these studies and our study that 65% of participants were CT-naïve suggest lack of exposure to CT/contrast practices among rural patients leads to uncertainty and reliance on point-of-care counselling. Kopp et al. (2022) noted that while digitized consent before contrast-enhanced CT was possible at high rates of completion, age was specifically cited as the primary factor associated with incomplete task participation and interaction with the consent workflow. [9] Takakuwa et al. (2010) identified similar trends in demographic variance in knowledge and attitudes of CT recipients; participants with higher education levels showed better knowledge performance, confirming that literacy and background impact perceptions and processing of risk information. [10] Taken together, our demographics (male predominance, low education, agriculture work, high proportion of first-time CT exposure) likely parallel rural

access and referral patterns in this patient population and may have contributed to low baseline preparedness for receiving contrast-related information; either way, they highlight the importance of low-literacy counselling techniques using clear, organized language to encourage informed consent and diminish uncertainty.

The baseline knowledge about contrast in our population was low: 25% knew why contrast was given, 15% knew minor things they could expect to feel and only 10% knew about major things to worry about (allergy/kidney problems). Even though 40% reported being told by a doctor, most specific safety points were poorly understood (fluids after contrast administration 21.7%; CT scans don't always require contrast 18.3%; kidney testing may be necessary beforehand 20%). Almost 45% learned about allergic reactions from someone else.

Lambertova et al. (2019) found large pre-CECT risk perception deficits: 46% underestimated secondary malignancy risk, 42% underestimated renal impairment risk, and 86% reported they were not told to maintain hydration before imaging, highlighting inadequate hydration counselling. After reviewing an information sheet, patients had improved knowledge but also increased fear (74%), highlighting how provision of information without reassurance c Alzahrani et al. (2021) found similar low awareness among the general population at baseline: 13.2% felt their knowledge was enough to educate someone else about IV contrast, 45.7% answered "do not know," 17.5% trusted the radiology doctor, and 3.5% avoided contrast studies due to side effects [4]. Alshehri (2023) found that 72% of contrast-referred patients did not understand the risks/benefits of IV contrast before imaging, with several specific misconceptions (e.g., contrast causes cancer [63.5%]; allergic reactions [62.2%]) [8]. According to Song et al. (2017), multimedia informed consent can enhance understanding of adverse effects, with a higher mean score for "adverse effects" in video-assisted consent compared to verbal consent (5.88 ± 1.27 vs. 4.24 ± 1.34, $p<0.001$). This suggests that standardised videos can enhance risk understanding [5]. Our findings support recent studies, which found that patients often lack awareness of contrast purpose, side effects, and renal/allergic concerns before CECT [4,6,8] and that how information is presented to patients affects learning and retention [5]. We believe this deficit in our rural population is due to low educational levels, limited CT scanning experience, exposure to anecdotal stories rather than formal education, and limited time spent with patients during point-of-care counselling when clinics may be focused on efficiency.

Patient attitudes towards the injection in our study were somewhat contradictory. While most patients were afraid of the injection itself (55%), they still expressed high trust in the medical professionals (90%) and willingness to receive the test again if recommended by their doctors (80%). Counselling regarding the test appears to help patients, with most patients stating that they felt less anxious after having the procedure explained to them (85%) and felt that contrast scans offer more information for diagnosis (78.3%). Lange et al. (2023) found that 30.8% of patients experienced anxiety before receiving CT with intravenous contrast and note that uncertainty regarding contrast administration and consent taking can cause anxiety. They also note common sensations patients experience during injection (feeling of warmth) and highlight that some patients educate themselves about the procedure on their own (commonly using internet sources) [7]. Tajaldeen et al. (2024) observed anxiety in 34% of CT patients and found it was more prevalent among those undergoing contrast-enhanced CT (22%) than non-contrast CT (12%); anxiety was also higher among patients without prior CT experience (24%), reinforcing that unfamiliarity and contrast use can amplify apprehension [11]. Lambertova et al. (2019) showed that although an information sheet corrected knowledge, it increased fear in 74%, with fear being more pronounced in younger female patients and those without previous CT, indicating that "information-only" strategies may unintentionally heighten anxiety if reassurance is not integrated [6]. In contrast, Scholz et al. (2019) reported that communication style influences satisfaction with pre-CECT briefing: patients perceiving a patient-centered communication style had higher satisfaction (mean 5.5 ± 0.849) than those perceiving physician-centered communication (mean 4.7 ± 1.080, $p<0.0001$), and women reported higher satisfaction (5.3 ± 1.043) than men (4.9 ± 0.790, $p=0.022$) [12]. Our findings are in concordance with these studies in showing that fear/anxiety is common around contrast CT [6,7,11], but can be mitigated when counselling is effective and communication is perceived as patient-centered [12]. The coexistence of fear (55%) with high trust (90%) in our rural cohort likely reflects a "high-trust/low-literacy" clinical interaction, where patients accept recommended procedures but remain anxious due to incomplete understanding; strengthening empathic, structured counselling may therefore improve both informed consent quality and patient comfort.

In our study, 40% reported discomfort during injection, but only 28.3% were advised regarding post-scan observation, indicating a counselling gap. Post-procedure reactions occurred in 10% and were mostly mild (nausea/vomiting 33.3%, itching/urticaria 25%, dizziness/headache 25%). Satisfaction with explanation and care was 70%; for future scans, 45% preferred both written and verbal information, 35% verbal only, and 20% written only.

It's interesting that Lange et al. found that body warmth was the most common feeling after IV contrast injection and that psychological health was also part of CT imaging patient safety [7]. Alzahrani et al. found that 3.5% of patients who refused CT contrast reported fear of side effects, but many who underwent contrast studies after hearing risks still experienced side effects, indicating that perceived or experienced reactions affect confidence [4]. According to Pomara et al., informed consent for contrast should cover risks, alternatives, and effects of refusal. However, time constraints and short patient-radiologist relationships can impact consent adequacy, communication, and patient satisfaction or anxiety with the procedure. Therefore, they pushed for communication format enhancements [3]. Song et al. found that video-assisted consent improved understanding of unfavourable consequences without affecting satisfaction (scores were similar: 2.73 ± 0.76 vs 2.70 ± 0.82, $p=0.67$) [5]. Our study supports this findings, suggesting instruction may be broadened without losing acceptance. We agree with literature that contrast injection correlates with expected injection sensations [7] and that counselling quality influences confidence and satisfaction [3,5]. Our study found 28.3% were told to return if they had responses, which may be due to hectic workflow and lack of standardised discharge counselling. We believe brief written handouts and vocal counselling, which 45% of patients preferred as "both", can improve patient experience by addressing safety and fear of readmission from online/community-based narratives.

## CONCLUSION

In our population receiving contrast-enhanced CECT in rural India, we found that patient knowledge about rationale for IV contrast, minor effects and major risks such as allergy and nephrotoxicity, and safety instructions was poor while attitudes were mostly positive with high regard for physicians, agreement with repeat testing if needed, and high perceived value of contrast enhanced examinations. Concern about having an exam was common, but counseling was felt to decrease anxiety for most patients emphasizing the importance of communication. Overall satisfaction with care

was fair. Specific opportunities for improvement were identified including receipt of pre- and post-procedure counselling and content of counselling especially around observation instructions. Interventions to enhance routine, standardized verbal counselling using simple language in the local dialect along with a short written handout as well as consistent safety instructions may improve informed consent, decrease anxiety, and enhance patient experience and safety in the rural practice of CECT.

**Table 1. Demographic and Clinical Profile of Rural Patients Undergoing CECT with Intravenous Contrast (N = 120)**

| Variable | Category | n (%) |
|---|---|---|
| Age group (years) | 18–30 | 32 (26.7) |
| | 31–45 | 44 (36.7) |
| | 46–60 | 30 (25.0) |
| | >60 | 14 (11.6) |
| Age (years) | Mean ± SD | 41.8 ± 14.2 |
| Gender | Male | 74 (61.7) |
| | Female | 46 (38.3) |
| Education level | <10th standard | 84 (70.0) |
| | ≥10th standard | 36 (30.0) |
| Occupation | Agriculture-based | 72 (60.0) |
| | Non-agriculture | 48 (40.0) |
| Previous CT scan | Yes | 42 (35.0) |
| | No | 78 (65.0) |

**Table 2. Knowledge Regarding Contrast Use During CECT Among Rural Patients (N = 120)**

| Knowledge item | Response | n (%) |
|---|---|---|
| Knows why contrast is injected during CT | Yes | 30 (25.0) |
| | No | 66 (55.0) |
| | Don't know | 24 (20.0) |
| Aware of minor side effects (warmth/metallic taste/nausea) | Yes | 18 (15.0) |
| | No | 84 (70.0) |
| | Don't know | 18 (15.0) |
| Aware of major risks (allergy/kidney issues) | Yes | 12 (10.0) |
| | No | 90 (75.0) |
| | Don't know | 18 (15.0) |
| Informed by doctor before the procedure | Yes | 48 (40.0) |
| | No | 72 (60.0) |
| Knows need to drink fluids after contrast | Yes | 26 (21.7) |
| | No | 94 (78.3) |
| Knows contrast is not used in all CT scans | Yes | 22 (18.3) |
| | No | 98 (81.7) |
| Heard about allergic reaction due to contrast (from others) | Yes | 54 (45.0) |
| | No | 66 (55.0) |
| Knows some patients require kidney function tests before contrast | Yes | 24 (20.0) |
| | No | 96 (80.0) |

**Table 3. Attitude and Perceptions Toward Intravenous Contrast Administration During CECT (N = 120)**

| Attitude statement | Agree n (%) | Neutral n (%) | Disagree n (%) |
|---|---|---|---|
| I feel scared about contrast injection | 66 (55.0) | 24 (20.0) | 30 (25.0) |
| I trust my doctor's decision to give contrast | 108 (90.0) | 6 (5.0) | 6 (5.0) |
| If advised again, I would undergo the same test | 96 (80.0) | 12 (10.0) | 12 (10.0) |
| Counseling/explanation reduced my anxiety | 102 (85.0) | 12 (10.0) | 6 (5.0) |
| Contrast-enhanced scans are more helpful for diagnosis | 94 (78.3) | 14 (11.7)* | 12 (10.0) |

**Table 4. Patient Experience During/After Contrast Injection and Preferred Communication (N = 120)**

| Experience/preference item | Category | n (%) |
|---|---|---|
| Discomfort during injection (warmth/nausea/pain) | Yes | 48 (40.0) |
| | No | 72 (60.0) |
| Informed to stay back for observation after scan | Yes | 34 (28.3) |
| | No | 86 (71.7) |
| Any reaction/problem after the procedure | Yes | 12 (10.0) |
| | No | 108(90.0) |
| Type of reaction among those with reaction (n = 12) | Nausea/vomiting | 4 (33.3) |
| | Itching/urticaria | 3 (25.0) |
| | Dizziness/headache | 3 (25.0) |
| | Other mild symptoms | 2 (16.7) |
| Satisfied with explanation and care provided | Yes | 84 (70.0) |
| | No | 36 (30.0) |
| Preferred information before future scans | Written | 24 (20.0) |
| | Verbal | 42 (35.0) |
| | Both | 54 (45.0) |
| Overall experience rating | Excellent | 28 (23.3) |
| | Good | 54 (45.0) |
| | Average | 30 (25.0) |
| | Poor | 8 (6.7) |

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